



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,044	06/08/2000	Joseph M. Jacobson	109026-0068	1282

7590

02/27/2003

TESTA HURWITZ & THIBEAULT
PATENT ADMINISTRATOR
HIGH STREET TOWER
125 HIGH STREET
BOSTON, MA 02110

EXAMINER

BEREZNY, NEAL

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/590,044

Applicant(s)

JACOBSON ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 is/are allowed.
- 6) ☒ Claim(s) 26-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 15.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connolly (6,399,303) in combination with Heath et al. (American Chemical Society; 1997). Connolly teaches a method of fabricating a bioelectronic component, the method comprising the steps of: positioning a biological material to be in electrical communication with at least one layer of said electrical device to facilitate an electrical measurement thereof, the electrical measurement being affected by the biological material, wherein the biological material is selected from the group consisting of proteins, polypeptides, nucleic acids, polysaccharides, carbohydrates, enzyme substrates, antigens, antibodies, pharmaceuticals, and combinations thereof, see abstract. Connolly does not specifically state the step of providing a batch of nanoparticles having submicron sizes and an electrical characteristic; depositing the nanoparticles onto a surface; sintering the batch of nanoparticles to form at least one layer of an electrical device, nor the use of a transistor, nor the formation of an array.
3. Heath teaches providing a batch of nanoparticles having submicron sizes and an electrical characteristic; line 1 of abstract, depositing the nanoparticles onto a surface;

Art Unit: 2823

p.190, section C; sintering the batch of nanoparticles to form at least one layer of an electrical device; p.191, second par. in Results section. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Heath with Connolly to form a thin monolayer of nanoparticles on the substrate in order to empower the artisan to individually manipulate the macroscopic solid with a tailored band structure, which would be useful for increasing the detection sensitivity of the device. Similarly, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the well-known array structure of single bio-circuit devices to enable the device to detect more than one biomaterial and to increase the sensitivity of the device. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the well-known practice of using a transistor in the electrical device in order to amplify the signal close to the source of the signal in order to improve the signal-to-noise ratio of the signal, thus improving the sensitivity of the device.

Allowable Subject Matter

4. Claims 1-13 are allowed. Connolly builds an array of bioelectronic device, causing the biomaterial, such as DNA and protein, to in electrical communication so as to have the biomaterial attached to the surface affect an electrical measurement, employing a self-assembly method, see abstract. Connolly does not appear to teach the use of nanoparticles with biomaterial shells. Weiss et al. (6,207,392) teaches forming probes from nanoparticles, which are coated with biomaterial, fig.3. Weiss

appears not to teach the deposition of these probes onto a surface to form a detection circuit. It appears that it would not be obvious to combine Weiss with Connolly because the probes of Weiss are designed to respond to radiation type systems and not for a sensor in a circuit on a substrate. In conclusion, the examiner has not found any art either singly or in combination that suggests that one of ordinary skill in the art at the time of the invention would have been able to anticipate and/or practice the claimed invention, without undue experimentation.

Response to Arguments

5. Applicant's arguments with respect to claims 26-28 have been considered but are moot in view of the new ground(s) of rejection.

CONCLUSION

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Application/Control Number: 09/590,044


Page 5

Art Unit: 2823

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NB

February 23, 2003


Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800